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"DEFINITION"

In our preceding papers the word "definition" was accepted for the procedures of mathematics and formal logic but was rejected for use with naming.[1] Naming procedures were styled "designations," and their most advanced forms, notable especially in modern science, were styled "specifications." Thereby definition and specification were held in terminological contrast for the uses of future inquiry.

Throughout our inquiry we have reserved the privilege of altering our terminological recommendations whenever advancing examination made it seem advisable. This privilege we now exercise in the case of the word "definition." For the purposes of the present paper we shall return the word to its ordinary loose usage, and permit it to range the wide fields of logic in its current great variety of ways. This step was forced upon us, for the moment, by the extreme difficulty we found in undertaking to examine all that has to be examined under "definition," while ourselves committed to the endorsement of a highly specialized use of the word. It is much better to abandon our suggested preference than to let it stand where there is any chance that it may distort the wider inquiry.

Our present treatment in effect deprives the word "definition" of the status we had planned to allot it as a "specification" for procedures in the mathematical and formal logical fields. Since we had previously rejected it as usable for namings, it will now itself as a name, for the time being at least, be reduced to the status of a "characterization," i.e., to that of a crude and loose preliminary form of naming.[2]

Regardless of any earlier comments[3] we shall for the present hold in abeyance any decision as to the best permanent employment of the word. The confusions that we are to show and the difficulties of probing deep enough to eliminate them would seem sufficient justification for rejecting the word permanently from any list of firm names. On the other hand the development of its specialized use in formal logic along the line from Frege and Hilbert down to recent "syntactics" (as this last is taken in severance from its associated "semantics") would perhaps indicate the possibility of a permanent place for it, such as we originally felt should be allotted it.

IF we begin by examining the ordinary English dictionaries, the Oxford, Century, Standard, and Webster's, for the definitions they provide for definition itself, we shall find them vague and

[1] This JOURNAL, Vol. XLII (1945), pp. 240–241, 245.

[2] For this terminology, see *ibid.*, Vol. XLIII (1946), pp. 645–663. The word "definition," i.e., today is pretense, not precision. Instead of having distinctive superiority over "specification," its current rating is the inferiority of "characterization."

[3] As, e.g., *ibid.*, p. 646n.

often a bit shifty in setting forth the nature of their own peculiar type of "definition," about which they might readily be expected to be the most definite: namely, the traditional uses of words. Instead, they are strongly inclined to take over some of the authority of the philosophies and the logics, in an attempt to make the wordings of these latter better intelligible to the general reader. Two directions of attention are manifest, sharply phrased in the earlier editions, and still present, though a bit more vaguely, in the later. First, there is a distinction between definition as an "act" (an actor here being understood) and definition as the "product" of an act (that is, as a statement in verbal form); and then there is a distinction between the defining of a word and the defining of a "thing," with the "thing," apparently, entering the definition just as it stands, as a component directly of its own right, as a word would enter. What is striking here, moreover, is the strong effort to *separate* "act" and "product" as different *kinds* of "meanings" under differently numbered entries, while at the same time *consolidating* "word" and "thing" in close *phrasal union,* not only inside the definition of "act" but also inside that of "product." In the Oxford Dictionary (1897)[4] entry No. 3 is for the "act" and entry No. 4 is for the statement *produced* by the act. The "act," we are told, concerns "what a thing is, or what a word means," while the "product" provides in a single breath both for "the essential nature of a thing," and for the "form of words by which anything is defined." Act and product are thus severed from each other although their "definitions" are so similar that they can hardly be told apart. So also with the Century (1897), in which act and product are presented separately in definitions that cover for each not only "word or phrase," but also what is "essential" of or to a "thing." The Standard has offered continuously for fifty years as conjoined illustrations of definition: "a *definition* of the word 'war'; a *definition* of an apple." The latest edition of Webster's (1934 copyright) makes "essential nature" now "archaic"; runs acts and processes of explaining and distinguishing together, with formulations of meaning "such as dictionary definitions" added to them for good measure; and then secures a snap-shot organization for Logic by a scheme under which "traditional logic" deals with the "kinds of thing" in terms of species, genera, and specific differences, while "later schools of logic" deal with statements "either of equivalences of connotation, or intension, or of the reciprocal implications of terms."

Now, a distinction between words and things other than words

[4] We omit, of course, entries irrelevant to the problem of knowings and knowns.

along conventional lines is easy to make. So is one between an "act" and the products of acts, especially when an "actor," traditionally hypostatized for the purpose, is at hand ready for use. In the present case of the dictionaries, what apparently happens is that if an actor is once obtained and set to work as a "definer," then all his "definings" are taken to be one *kind* of act, whether concerned with words or with things: whereupon their products are taken as equally of one *kind*, although *as* products they belong to a realm of "being" different from that to which actors as actors belong. In the present inquiry we shall have a continuous eye on the dealings logical definition has with words and things, and on the manner in which these dealings rest on its separation of product from acts. We shall not, however, concern ourselves directly with the underlying issues as to the status of acts and products with respect to each other.[5] As to this it is here only to be remarked that in general any such distinction of product from act is bad form in modern research of the better sort. Fire, as an "actor," expired with phlogiston, and the presence of individually and personally existing "heat" is no longer needed to make things hot.

These remarks on what the ordinary dictionaries accomplish should keep our eyes close to the ground—close to the primary facts of observation—as we advance in our further examinations. Whether a dictionary attempts patternings after technical logical expressions, whether it tries simplified wordings, or whether it turns towards evasiveness, its troubles, under direct attention, are in fairly plain view. Elsewhere the thick undergrowth of verbiage often subserves a concealment.

This inclusion of *what a thing is* with *what a word says* goes back to Aristotle. Aristotle was an observer and searcher in the era of the birth of science. With him, as with his contemporaries, all knowledge, to be sound, or, as we would say today, to be "scientific," had to win through to the completely fixed, permanent, and unchangeable: to the "essence" of things, to "Being." Knowledge was present in definition, and *as* definition.[6] Word

[5] For some illustrations of the separation of "acts" and "products" in the logics, see the paper by Arthur F. Bentley, "On a Certain Vagueness in Logic," this JOURNAL, Vol. XLII (1945), especially pp. 9, 50. Several related confusions in logical expression are there also discussed. See also "Logicians' Underlying Postulations," *Philosophy of Science*, Vol. 13 (1946), pp. 3–19; and a paper "The New 'Semiotic,'" scheduled to appear in *Philosophy and Phenomenological Research*, September, 1947.

[6] "Opinion" was allowed for as dealing with uncertainties, but on a lower level; it was *not* knowledge, it was *not* definition.

and thing, in this way, came before him conjoined. The search for essences came to be known classically as "clarification."[7] Clarification required search in two directions at once. Definition must express the essences; it must also be the tool for finding them. Species were delimited through the "forms" that make them *what* they are. It was in the form of Speech (*Logos*) that logic and ontology must come into perfect agreement.

Aristotle held thus together the subject-matters that came together. He did not first split apart, only to find himself later forced to try to fit together again what had thus been split. The further history is well known to all workers in this field. The Middle Ages retained the demand for permanence, but developed in the end a sharp split between the name and thing, with an outcome in "isms." On one side were the nominalists (word-dizzy, the irreverent might say), and on the other side the realists (comparably speaking, thing-dizzy). Between them came to stand the conceptualists, who, through and artificial device which even today still seems plausible to most logicians, inserted a fictitious locus —the "concept"—in which to assemble the various issues of word and thing. The age of Galileo broke down the requirements of immutability, and substituted uniformities or "laws" for the old "essences" in the field of inquiry. Looking back upon that age, one might think that the effect of this change on logic would have been immediate and profound. Not so. Even today the transformation is incomplete in many respects, and even the need for it is often not yet brought into the clear. John Stuart Mill made a voyage of discovery, and developed much practical procedure, as in the cases of naming and induction, but his logic held to dealings with "laws" as separate space-time connections presented to knowledge, and was essentially pre-Darwinian in its scientific setting, so that many of the procedures it stresses are now antiquated.[8]

The Aristotelian approaches were, however, sufficiently jarred to permit the introduction in recent times of "non-Aristotelian"

[7] Felix Kaufmann is one of the comparatively few workers in this field who make deliberate and sustained—and in his case, powerful—efforts to develop "clarification" in the classical sense (*Methodology of the Social Sciences*, 1944). He expressly affirms this approach (*Philosophy and Phenomenological Research*, Vol. V, 1945, p. 351) in the sense of *Meno*, 74 ff., and *Theaetetus*, 202 ff.

[8] Mill managed to see adjectives as names (*Logic*, I, i, chap. ii, sec. 2) but not adverbs. By way of illustration drawn from our immediate range of subject-matters, consider how much sharper and clearer the adverb "definitely" is in its practical applications than is an adjectival assertion of definite*ness*, or a purported "nounal" determination of what "definition" substantively *is*.

devices. These were forecast by a new logic of relations. These "relations," though not at all "things" of the ancient types, nevertheless struggled from the start (and still struggle) to appear as new variations of the old, instead of as disruptive departures from it. Logical symbols were introduced profusely after the pattern of the older mathematical symbols, but more as usable notations than as recognizing a new outlook for logic.

In addition to the greatly changed appearance since Greek days of the "objects" presented as "known," the so-called "contents" of knowledge,[9] there are certain marked differentiations in techniques of presentation (in the organization of "words" and "sentences" to "facts") which are of high significance for the logic of the future. For one thing, there is the difference between what "naming" has come to be in science since Darwin, and what it was before his time; for another, there is the difference between what a mathematical symbol is in mathematics today and what it was when it was still regarded as a type of naming.[10] Neither of these changes has yet been taken up into logical understanding to any great extent, however widely discussion in the ancient forms of expression has been carried on. The common attempt is to reduce logical, mathematical, and scientific procedures to a joint organization (usually in terms of some sort of single mental activity presumed at work behind them) in such a way as to secure a corresponding forced organization of the presumptive "thing," logical, mathematical, and scientific, they are supposed to deal with.

One may illustrate by such a procedure as that of Bertrand Russell's "logical atomism," in which neither Russell nor any of his readers can at any time—so far as the "text" goes—be quite sure whether the "atoms" he proposes are minimal "terms" or minimal "reals." Comparably, in those logical systems which use "syntactics" and "semantics," as soon as these distinctions

[9] Consider, for example, astronomy, with respect to which Greek science found itself inspecting a fixed solar system moving about the fixed earth, with sun and moon moving backward and forward, and the firmament of fixed stars rotating above. Its physics offered four fixed elements, different in essence, with earth movements downward toward their proper "end"; fire movements upwards into the heavens; air and gas movements upwards as far as the clouds or moon; and water movements and those of all liquids back and forth. Its biology had fixed animal and plant species, which remained fixed until Darwin.

[10] The problem in this respect began as far back as the first uses of zero or minus-one, and has only disappeared with the heavy present employment of the wave in mathematical formulation. Professor Nagel has lately given such fine illustrations of this status that, with his permission, we should like to recommend to the reader the examination of his pages as a part of our text at this point (this JOURNAL, Vol. XLII, 1945, pp. 625–627).

have been made, an attempt follows to bring them together again by "interpretations." But the best of these "interpretations" are little more than impressionistic manifestations of wishfulness, gathering within themselves all the confusions and uncertainties which professedly have been expelled from the primary components. Although the "definitions" in this treatment are established primarly with reference to "syntactics" they spawn various sub-varieties or queer imitations on the side of "semantics." We seem to have here echoings of the old artificial isolations of form from content, along with a companionate isolation of things from minds, of a type that "transactional" [11] observation and report overcome.

In summary we find word and thing in Aristotle surveyed together but focused on permanence. In the later Middle Ages they came to be split apart, still with an eye on permanence, but with nothing by way of working organization except the tricky device of the "concept" as a third and separate item. Today logic presents, in this historical setting, many varieties of conflicting accounts of definition, side-slipping across one another, compromising and apologizing, with little coherence, and few signs of so much as a beginning of firm treatment. We shall proceed to show this as of the present. What we may hope for in the future is to have the gap between name and object done away with by the aid of a modern behavioral construction which is Aristotelian in the sense that it is freed from the post-Aristotelian dismemberment of man's naming activities from his named world, but which at the same time frees itself from Aristotle's classical demand for permanence in knowledge, and adapts itself to the modern view of knowledge as in continuing growth.[12]

Since, as we have said, we are attempting to deal with this situation on the ground level, and in the simplest wordings we can find, it may be well to preface it with a brief account of an inquiry into definition carried on throughout in highly sophisticated professional terminology, which exhibits the confusions in fact, though without denouncing them at their roots. Walter Dubislav's *Die Definition* [13] is the outstanding work in this field. In discussing

[11] See our paper, "Transactions as Known and Named," this JOURNAL, Vol. XLIII (1946), pp. 533–551.

[12] Compare the development in John Dewey, *Logic* (1938), chap. XXI, on "Scientific Method: Induction and Deduction," especially pages 419, 423, 424.

[13] Third edition, 1931, 160 pages (*Beihefte der "Erkenntnis"*, 1). Citations from pages 17, 131. Historically Dubislav finds four main "theories" of definition: the Aristotelian essence and its successors to date (*Wesensbestimmung*); the determination of concepts (*Begriffsbestimmung*); the

Kant and Fries he remarks that they do not seem to observe that the names they employ bring together into close relations things which by rights should be most carefully held apart; and in another connection he suggests that one of the important things the logician can do is to warn against confounding definitions with verbal explications of the meaning of words. His analysis yields five types (*Arten*) of definitions, the third of which, he is inclined to think, is merely a special case of the first. These are: (1) Special rules of substitution within a calculus; (2) Rules for the application of the formulas of a calculus to appropriate situations of factual inquiry; (3) Concept-constructions; (4) Historical and juristic clarifications of words in use; (5) Fact-clarifications, in the sense of the determination of the essentials (*Inbegriff*) of things (*Gebilde*), these to be arrived at under strictly logical-mathematical procedure out of basic presuppositions and perceptual determinations, within a frame of theory; and from which in a similar way and under similar conditions all other assertions can be deduced, but with the understanding (so far as Dubislav himself is concerned) that things-in-themselves are excluded as chimerical.[14] A comparison of the complexly terminological composition of No. 5 with the simple statements of Nos. 1, 2, and 4, or even with the specialized appearance of simplicity in No. 3, gives a fair idea of the difficulties of even talking about definition from the older viewpoints.

Definition may be—and often is—talked about as an incidental, or even a minor, phase of logical inquiry. This is the case both when logic is seen as a process of "mind" and when the logician's interest in it is primarily technological. In contrast with this view, the processes of definition may be seen as the throbbing heart —both as pump and as circulation—of the whole knowledge system. We shall take this latter view at least to the extent that when we exhibit the confusions in the current treatments of definition, we believe that we are not exhibiting a minor defect but a vital disease. We believe, further, that here lies the very region

fixation of meanings, historic and juristic (*Feststellung der Bedeutung . . . bzw., der Verwendung*); and the establishment of new signs (*Festsetzung über die Bedeutung . . . bzw., der Verwendung*).

[14] The characterization of type No. 5 in the text above is assembled from two paragraphs of Dubislav's text (pp. 147, 148) which are apparently similar, but still not alike in content. Dubislav's own view as to what should be regarded as definition makes use of type No. 1 along lines of development from Frege to Hilbert (with a backward glance at Pascal), and in the expectation that its "formal" can be made "useful" through definitions of type No. 2.

where inquiry into naming and the named is the primary need, if dependable organization is to be attained. The field for terminological reform in logic generally is much wider, it is true, than the range of the word "definition" alone, and a brief reminder of these wider needs may be in order. In logic a definition may enter as a proposition, or as a linguistic or mental procedure different from a proposition; while, alternatively, perhaps all propositions may be viewed as definitions. A proposition itself may be almost anything;[15] it consists commonly of "terms," but terms, even while being the "insides" of propositions, may be either words or non-verbal "things." The words, if words enter, may either be meanings, or have meanings. The meanings may be the things "themselves" or other words. Concepts may appear either as "entities" inserted between words and things, or as themselves words, or as themselves things. Properties and qualities are perhaps the worst performers of all. They may be anything or everything, providing it is not too definite.

The following exhibits, some of confusion, others of efforts at clarification, are offered much as they have happened to turn up in current reading, though supplemented by a few earlier memoranda and recollections. We shall display the confusions directly on the body of the texts, but intend thereby nothing invidious to the particular writers. These writers themselves are simply "the facts of the case," and the case itself is one, at this stage, for observation, not for argumentation or debate.

For philosophers' views we may consult the philosophical dictionaries of Baldwin (1911), Eisler (German, 1927), Lalande (French, 1928), and Runes (1942). If definition "clarifies," then the philosophical definitions of definition are far from being themselves definitions. Ancient terminologies are at work, sometimes with a slight modernization, but without much sign of attention to the actual life-processes of living men, as modern sciences tell us about them. Robert Adamson, in Baldwin, proceeds most firmly, but also most closely under the older pattern.[16] Both acts and resultant products are, for him, definitions, but the tops and bottoms of the process—the individual objects, and the

[15] For illustrations and references as to propositions, see Bentley, "Logicians' Underlying Postulations," *Philosophy of Science*, Vol. 13 (1946), page 19.

[16] Adamson, who was one of the most impartial observers and keenest appraisors of logical theory, himself remarked in *A Short History of Logic* (1911), pp. 19–20, that "looking to the chaotic state of logical textbooks . . . one would be inclined to say that there does not exist anywhere a recognized, currently received body of speculations to which the title logic can be unambiguously assigned."

summa genera—are "indefinables."[17] Nominal definitions concern word-meanings, and real definitions concern the natures of things defined; analytic definitions start with notions as given, and synthetic definitions put the notions together; rational definitions are determined by thought, and empirical definitions by selective processes. This is all very fine in its way, but effectively it says little of present-day interest.

Lalande first identifies "definition" in a "general logic" dealing with the action of *l'esprit;* and then two types in "formal" logic, one assembling known terms to define the concept, the other enunciating equivalences. He also notes the frequent extension of the word "definition" to include all propositions whatsoever. Eisler adds to *Nominaldefinition* and *Realdefinition,* a *Verbaldefinition,* in which one word is merely replaced by others. Besides this main division he reports minor divisions into analytic, synthetic, and implicit, the last representing Hilbert's definition of fundamental geometrical terms.

Alonzo Church, in Runes's dictionary, stands closer to contemporary practice, but shows still no interest in what in ordinary modern inquiry would be considered "the facts of the case," namely, actual uses. He mixes a partial report on contemporary practices with a condensed essay on the proprieties to such an extent that it is difficult to know what is happening.[18] For a first grouping of definitions, he offers (*a*) (in logistic systems proper) nominal or syntactical definitions which, as conventional abbreviations or substitutions, are merely a sort of minor convenience for the logician, though nevertheless, it would seem, they furnish him one hundred per cent of his assurance; and (*b*) (in "interpreted logical systems") semantical definitions which introduce new symbols, assign "meanings" to them, and can not appear in *formal* development, although they may be "carried" implicitly by nominal definitions, and are candidates for accomplishing almost anything that may be wished, under

[17] The introduction of such an "indefinable," of which we shall later find various examples, is, in effect, to make proclamation of ultimate impotence precisely at the spot in logical inquiry where sound practical guidance is the outstanding need.

[18] It is proper to recall that the contributors to Runes's dictionary had much fault to find with the way their copy was edited, and that, therefore, the dictionary text may not fully represent Professor Church's intention. The difficulty to be stressed is, however, not peculiar to his report. A similar confused mixture of what is "historical" with what is "factual" is general. The Runes classification, as we find it, is in this respect vague at almost every point of differentiation. More broadly for all four philosophical dictionaries, the manifestly unclarified phrasings seem to outnumber the attempted clarifications a dozen to one.

a properly adapted type of "intent." As a second grouping of definitions he offers the "so-called real" definitions which are not conventions as syntactical and semantical definitions are, but instead are "propositions of equivalence" (material, formal, etc.) between "abstract entities"; which require that the "essential nature" of the definiendum be "embodied in" the definiens; and which sometimes, from other points of approach, are taken to convey assertions of "existence," or at least of "possibility." He notes an evident "vagueness" in "essential nature" as this controls "real" definition, but apparently sees no source of confusion or any other difficulty arising from the use of the single word "definition" for all these various purposes within an inquiry, nor in the various shadings or mixtures of them, nor in the entry of definienda and definientia, sometimes in "nominal" and sometimes in "real" forms, nor in livening up the whole procedure, wherever it seems desirable, with doses of "interpretative" intent.[19]

Here are other specimens, old and new, of what is said about definition. Carnap expressly and without qualification declares that a definition "means" that a definiendum "is to be an abbreviation for" a definiens, but in the same inquiry introduces definitions that are not explicit but recursive, and provides for definition rules as well as for definition sentences. Elsewhere he employs two "kinds" of definition, those defining respectively logical and empirical "concepts," and makes use of various reduction processes to such an extent that he is spoken of at times as using "conditioned" definitions.[20] Tarski makes definition a stipulation of meaning which "uniquely determines," differentiating it thus

[19] How curiously this sort of thing works out can be seen in the opening pages of Church's *Introduction to Mathematical Logic*, Part I (1944), in which he writes (p. 1): "In the formal development we eschew attributing any meanings to the symbols of the Propositional Calculus"; and (p. 2): "We shall be guided implicitly by the interpretation we eventually intend to give it." Repeated examinations which several interested inquirers have made into Church's words, "meanings," "natural," "necessary," "language," "implicit," and "interpretation," as he has used them in the context of the sentences just quoted, have given no aid towards reducing the fracture in his constructional bone. As pertinent to the issue it may be recalled that Kurt Gödel, in analyzing Russell's procedure, came to the conclusion that Russell's formalism could not "explain away" the view that "logic and mathematics (just as physics) are built upon axioms with a real content" (*The Philosophy of Bertrand Russell*, P. A. Schilpp, editor, p. 142). Again, Hermann Weyl in the *American Mathematical Monthly*, 1946, p. 11, remarks of Hilbert that "he is guided by an at least vaguely preconceived plan for such a proof."

[20] *Introduction to Semantics* (1942), pp. 17, 31, 158. "Testability and Meaning," *Philosophy of Science*, Vol. 3 (1936), pp. 419–471, especially pp. 431, 439, 448; Vol. 4 (1937), pp. 1–40.

from "designation" and "satisfaction." [21] An often quoted definition of definition by W. L. Davidson is that "It is the object of Definition to determine the nature or meaning or signification of a thing: in other words definition is the formal attempt to answer the question 'What is it?'" [21a] H. W. B. Joseph writes: "The definition of anything is the statement of its essence: what makes it that, and not something else." [22] J. H. Woodger limits the word for axiom-systems to "one quite definite sense," the "explicit"—understanding thereby substitutability; however differently the word might elsewhere be used.[23] Henry Margenau distinguishes between constitutive and operational.[24] A. J. Ayer has "explicit" or "synonymous" definition in contrast with philosophical "definition in use." [25] Morris Weitz employs the names "real" and "contextual." [26] A. W. Burks proposes to develop a theory of ostensive definition which describes "definition in terms of presented instances, rather than in terms of already defined concepts," and says that counter-instances as well as instances must be pointed at; such definition is thereupon declared to be classification.[27] W. E. Johnson decides that "every definition must end with the indefinable," where the indefinable is "that whose meaning is so directly and universally understood, that it would be mere intellectual dishonesty to ask for further definition"; he also thinks, interestingly enough, that it would "seem legitimate . . . to define a proper name as a name which *means* the same as what it *factually indicates.*" [28] G. E. Moore insists on a sharp separation between defining a word and defining a concept, but leaves the reader wholly uncertain, beginning, middle, and end, what the distinction

[21] *Introduction to Logic* (1941), pp. 33–36, pp. 118 ff. "The Semantic Conception of Truth," *Philosophy and Phenomenological Research*, Vol. 4 (1944), p. 345, and notes 20 and 35.

[21a] *The Logic of Definition* (1885), p. 32.

[22] *An Introduction to Logic* (1916), p. 72.

[23] *Axiomatic Method in Biology*, p. 4.

[24] "On the Frequency Theory of Probability," *Philosophy and Phenomenological Research*, Vol. VI (1945), p. 17.

[25] *Language, Truth and Logic* (1936), pp. 66–69. A comparison of the respective uses of the word "explicit" by Carnap, Woodger, and Ayer might be instructive.

[26] "The Unity of Russell's Philosophy," in *The Philosophy of Bertrand Russell* (P. A. Schilpp, editor) (1944), pp. 120–121. The following pronouncement (p. 121) on the subject would seem worthy of profound pondering: "The value or purpose of real and contextual definitions is that they reduce the vaguenesses of certain complexes by calling attention to their various components."

[27] "Empiricism and Vagueness," this JOURNAL, Vol. XLIII (1946), p. 479.

[28] *Logic* (1921), Vol. I, pp. 105–106; p. 93.

between word and concept itself might be in his system, or how it might be defined to others.[29] What current philosophizing can accomplish under the aegis of the loose and vagrant use of "definition" by the logics is illustrated by Charles Hartshorne in a definition of "reality" which ideal knowledge is said to "provide" or "give" us by the aid of a preliminary definition of "perfect knowledge." This "definition" of "reality" is: "The real is whatever is content of knowledge ideally clear and certain,"[30] and in it, however innocent and simple the individual words may look separately, there is not a single word that, in its immediate context, is itself clear or certain.

The above specimens look a good deal like extracts from a literature of escape, and some might rate well in a literature of humor. No wonder that Professor Nagel says of Bertrand Russell (who may be regarded as one of the ablest and most active investigators of our day in such matters) that "it is often most puzzling to know just what he is doing when he says that he is 'defining' the various concepts of mathematics";[31] and that Professor Skinner, discussing the problems of operational definition with some of his psychological colleagues, tells them that while definition is used as a "key-term," it itself is not "rigorously defined," and that "modern logic . . . can scarcely be appealed to by the psychologist who recognizes his own responsibility."[32]

Turn next to recent reports of research into the question. A paper by H. H. Dubs, "Definition and its Problems,"[33] gives an excellent view of the difficulties logicians face when they strive to hold these many processes together as one. Present theories of definition are recognized by him as confused, and the time is said to have arrived when it has become necessary to "think through" the whole subject afresh. Apart from the "dictionary" kind,[34]

[29] "A Reply to My Critics," in *The Philosophy of G. E. Moore* (P. A. Schilpp, editor), pp. 663–666.

[30] "Ideal Knowledge Defines Reality: What was True in 'Idealism,'" this JOURNAL, Vol. XLIII (1946), p. 573.

[31] In his contribution to *The Philosophy of Bertrand Russell*, edited by P. A. Schilpp, p. 326.

[32] "Symposium on Operationism," *Psychological Review*, Vol. 52 (1945), pp. 270–271.

[33] *Philosophical Review*, Vol. 52 (1943), pp. 566 ff.

[34] It is interesting to note that one of his requirements for a dictionary definition is that it "must be capable of being written down." This is not demanded for the "scientific definition" for which there are "two and only two" specific requirements: it must be commensurate with what it defines, and it must define a term only in terms that have been previously defined.

all definition is set down as "scientific definition," logic and mathematics being consolidated with "science" as branches of it. Science itself is described as a linkage of concepts, and the general decision is reached for definition that it must tell us what the "concepts" are which are to be associated with a "term or word" so as to determine when, "in immediate experience or thought," there is present the "entity or event" denoted by that term or word.

Definitions, in Dubs' development, are classified as conceptual or non-conceptual. The former is, he says, what others often call "nominal" and occurs where term is linked only with term. The latter are "inevitable" and occur where the linkage runs back to "logical ultimates" or "indefinables." Cutting across this classification appears another into "essential" and "nominal" (sometimes styled "real" and "accidental") depending on whether we can or can not so define a term as to denote "all" the properties of the object or other characteristic defined. Practically, he reports, scientific definition consists almost entirely of the conceptual and the nominal, even though "scientific" has been adopted as the name of *all* definition.

If we examine the non-conceptual indefinables in this presentation, we find that they consist of (*a*) causal operations (necessarily "wordless"), (*b*) direct pointings or denotings (that "cannot be placed in books"), and (*c*) intermediate hermaphroditic specimens, half pointings and half verbalizings. Dubs is not at all pleased to find his scheme of definition falling back upon the "indefinable," but his worry is mainly in the sense that he would prefer to reach "ultimates." He solaces himself slightly by hoping that it is just an affair of nomenclature. Nevertheless, since in certain cases, such as those of logic and mathematics, indefinables are seen entering which, he feels sure, are *not* ultimates, he feels compelled to keep the "indefinable" as an outstanding component of definition (or, shall we say, of the "definable"?) without permitting this peculiarity to detract from the hope that he has secured a new "practical and consistent" theory.

Especially to note is that while his leading statement about definition depends upon the use of such words as "concept," "term or word," "immediate experience," "thought," and "entity or event," no definition or explanation of any sort for these underlying words is given. They rate thus, perhaps, as the indefinables of the definition of definition itself, presumably being taken as so well known in their mental contexts that no question about them will be raised. We have already seen the indefinable mentioned by Adamson and Johnson (and the related "ostensive" by Burks),

and we shall see more of the peculiar problem they raise as we go along.

Consider another type of examination such as that offered by John R. Reid under the title: "What are Definitions?"[35] Here the effort is to solve the problem of definition not by classifying, but by the building up, or "integration," of a "system of ideas" into an "articulated unity." Taking for consideration what he calls a "definitional situation," he distinguishes within it the following "factors" or "components": a "definitional relation," a "definitional operation," and a "definitional rule." While distinct, these factors are not to be taken as "isolated." The "rule" seemingly is given top status, being itself three-dimensional, and thus involving sets of symbols, sets of cognitive interpretants, and particular cases to which the rule can apply. He holds that we can not *think* at all without this definitional equipment, and stresses at the same time that the symbols, as part of the equipment, would not exist at all except in mental activity. This makes "mental activity" both cause and product, and apparently much the same is true for "symbol." The above points are elaborately developed, but all that is offered us in the way of information about definition itself is a recognition, in currently conventional form, that definitions may be either "syntactical" or "semantical," and that the word "definition" remains ambiguous unless it has an accompanying adjective thus to qualify it. This difference is assumed, but the differentiation is not studied; nor, apparently, is it considered to be of much significance in theory.

Not by pronouncement, but in their actual procedures, both Dubs and Reid bring definition under examination as a facultative activity in the man who does the defining and who is the "definer," and as having, despite its many varieties, a single "essential" type of output. Where Dubs undertakes through cross-classifications to make the flagrant conflicts in the output appear harmonious, Reid strives to establish unity through a multiplication of "entities," arriving thus only at a point at which the reader, according to his likings, will decide either that far too many entities are present, or nowhere near enough.[36]

[35] *Philosophy of Science*, Vol. 13 (1946), pp. 170–175.

[36] Reid's asserted background for his inquiry into definition may be illustrated by the further citations: "A . . . relation is the symbolic product of an . . . operation . . . according to . . . rule." "These distinctions are . . . not only 'real' . . . but . . . fundamental for . . . understanding." We must not deny "the irreducible complexity of the relevant facts." "Definitions . . . are . . . not assertable statements." Reid is here frank and plain about what ought to be in the open, but which in most discussions of definition is left tacit.

Let us turn next to the deliberations of a group of six scientists and logicians in a recent symposium from which we have already quoted one speaker's pungent comment.[37] Among the questions set up for examination was one (No. 10), which asked: "What is a Definition, operational or otherwise?" Two of the contributors, so far as they used the word "definition" at all, used it in conventional ways, and gave no direct attention to its problems, so we can pass them by. Two others, Feigl and Boring, used stylized phrasings, one in a slightly sophisticated, the other in a currently glib form, and have interest here merely to note the kind of tunes that can be played.

Feigl regards definition as useful in minor ways in helping to specify meanings for terms or symbols. Since it deals with terms or symbols it is always "nominal," and the "so-called real" definitions rate as mere descriptions or identifications. Nevertheless, although all definition is "nominal," it always terminates in something "not nominal," namely, observation. This might leave the reader uncertain whether a definition is still a definition after it has got beyond the nominal stage, but Feigl gets rid of this difficulty by calling it "a mere question of terminology." Boring defines definition as a "statement of equivalence," and says it can apply between a term and other terms or between a term and "events"—blandly inattentive to the question as to just in what sense a "term" can be *equivalent* to an "event." He further distinguishes definitions as either operational or non-operational, without, apparently, any curiosity as to the nature of the difference between the operational and the non-operational, nor as to what might happen to an assured equivalence on the operation table with or without benefit of anesthetic.

This leaves two contributors to the symposium, Bridgman, the physicist, and Skinner, the psychologist, to give useful practical attention to the business in hand, operational and definitional.[38] Bridgman, standing on the solid practical ground he has long held with respect to physical procedure, treats definitions as statements applying to terms. Such definitions, he says, presuppose checking or

[37] "Symposium on Operationism," *Psychological Review*, Vol. 52 (1945), pp. 241–294. Introduction by the editor, Herbert S. Langfeld. Contributions by Edwin G. Boring, P. W. Bridgman, Herbert Feigl, Harold E. Israel, Carroll C. Pratt, and B. F. Skinner.

[38] Bridgman, however, is still deeply concerned with a query as to the "public" *vs.* the "private" in knowledge; and the others followed him so strongly in its discussion that in the seventeen pages of "rejoinders and second thoughts" following the primary papers, one-third of all the paragraphs directly, and possibly another third indirectly, had to do with this wholly fictitious, time-wasting issue.

verifying operations, and are thus not only operational, but so completely so that to call them "operational" is a wholly unnecessary tautology. Skinner, making the same kind of hard, direct operational analysis of the psychological terms that Bridgman made twenty years ago for physical terms, tosses out by the handful the current evasive and slippery phrasings wherever he finds them, and lays the difficulties, both in the appraisals of operation and in the appraisals of definition, to the fact that underlying observation and report upon human behaviors are still far too incomplete to give dependable results. He rejects dualisms of word and meaning, and then settles down to the application of plain, practical, common sense to the terminology in use—to the problem, namely, of what words can properly stand for in observation and experimentation in progress, and to the tentative generalizations that can be made from the facts so established. Skinner agrees with Bridgman that operational analysis applies to all definitions. For him a good answer to the question "What is a definition?" would require, first of all, "a satisfactory formulation of the effective verbal behavior of the scientist." His own undertaking is to contribute to the answer "by example." The others in this symposium might well be asked to become definite as to the status of whatever it is they mean when they say "*non*-operational."

The examinations, both by Bridgman and by Skinner, are held to the regions we ourselves have styled "specification" in distinction from those of "symbolization." For us they lead the way from the antiquated manners of approach used by the other workers we have just examined to three papers, all published in the past year, and all in this JOURNAL, in which much definite progress has been made. They are papers by Abraham Kaplan, Ernest Nagel, and Stephen C. Pepper. We shall note the advances made and the openings they indicate for future work. We regret it if other equally advanced investigations have failed to attract our attention.

Kaplan's paper is styled "Definition and Specification of Meaning."[39] In it he examines "specification of meaning" as a process for improving the applicability of terms, and as thus leading the way towards definition in the older logical sense of a "logical equivalence between the term defined and an expression whose meaning has already been specified." He sets up the connection between specification and equivalence of meaning as a goal, but in the present paper does not undertake to deal with its problems, limiting himself here instead to an examination of some of the matters to take account of in such a theory. He acutely observes that

[39] This JOURNAL, Vol. XLIII (1946), pp. 281–288.

much of the best work of science is done with "concepts" such as that of species for which all the long efforts of the biologists have failed to secure any "definition" whatever, and proceeds to ask how this can be possible if definition is so potent and so essential as logicians make it out to be. Treating "specification of meaning" as "hypothetical throughout," he leads up to the question: How does such a development of meaning come to approximate, and in the end to attain, the character of logical definition in which the meanings are no longer held within the limits of hypothesis (though, nevertheless, under the reservation that in the end, definition may possibly come to appear as "only a special form of specification")?

A great field of inquiry is thus opened, but certain difficulties at once demand attention. Kaplan employs, as if well understood, certain key-words in connection with which he gives no hint of specification on their own account. These include such words as "concept," "term," and "meaning." In what sense, for example, in his own development, does "specification of meaning" tell more than "specification" alone? What additional "meaning" is added by the word "meaning"? Is this "meaning" in any way present apart from or in addition to its "specification"? If "meaning" adds anything, should its particular contribution not be made clear at an early point in the treatment—a point earlier, indeed, than Kaplan's present discussion? What is the difference between "meaning" by itself and "meaning of a term"—a phrase often alternatively used? If "term" has to have a "meaning" and its "meaning" has to be separately "specified," is the inquiry not being carried on at a stage twice removed—and unnecessarily removed at that—from direct observation? If three stages of "fact" are thus employed, should not their differentiation be clearly established, or their manner of entry at least be indicated? These questions are asked, not to discourage, but as encouragement for, the further examination which Kaplan proposes, if the relations of equivalence and specification are to be understood.

Nagel, in his paper "Some Reflections on the Use of Language in the Natural Sciences,"[40] understands by "definition" very much what Kaplan understands by specification. He does not, for the immediate purposes of his discussion of language, generalize the problem as Kaplan does, but he shows brilliantly the continuous revision and reconstruction of uses which an active process of definition involves. We have already cited, in passing, his valuable pages on the growing abandonment by mathematicians of their older expectations that their symbols should have efficient status as

[40] This JOURNAL, Vol. XLII (1945), pp. 607–630.

names. He provides an illuminating illustration of the underlying situation in the case of "constant instantial velocity" which by its very manner of phrasing makes it operationally the "name" of nothing at all, while nevertheless it steadily maintains its utility as a phrase.[41] He eliminates the claims of those types of expression which, applied in a variety of meanings through a variety of contexts, manage to fascinate or hypnotize the men who use them into believing that, as expressions, they possess "a generic meaning common to all" their varieties of applications. He could even have used his own word "definition" as an excellent example of such a form of expression. In the background of his vividly developed naturalistic appraisal of the processes of knowledge, all of these steps have high significance for further progress.

Pepper's account of "The Descriptive Definition" [42] undertakes a form of construction in the very region which Kaplan indicates as locus of the great problem. His "descriptive definition" is so close to what we ourselves have elsewhere described as "specification" [43] that, so far as his introductory characterization goes, we could gladly accept his account of it, perhaps free from any reservation, as meeting our needs. It offers at the least a fair alternative report to that which we seek. His framework of interpretation is, however, another matter, and his "descriptive definition," as he sees it, is so intricately built into that framework that it must be appraised as it there comes.

Like Kaplan with his specification of meaning Pepper envisions the old logical definition as basic to the display and justification of a descriptive definition. He notes that "in empirical enquiry observers desire expressions which ascribe meaning to symbols with the definite proviso that these meanings shall be as nearly true to fact as the available evidence makes possible." To this end the reference of description is "practically never" to be taken as "unalterable." He does not offer a fully positive statement, but at least, as he puts it in one phrasing, the "reference" of the symbol under the description is "intended" to be altered whenever "the description can be made more nearly true." The descriptive definition thus becomes "a convenient tool constantly responsible

[41] His statement, of course, is not in terms of "naming." As he puts it, such expressions "are *prima facie inapplicable* to anything on land or sea"; they "*apparently* have no pertinent use in connection with empirical subject-matter," as "no overtly identifiable motions of bodies can be characterized" by them (*op. cit.*, pp. 622–623).

[42] This JOURNAL, Vol. XLIII (1946), pp. 29–36.

[43] This JOURNAL, "Specification," Vol. XLIII (1946), pp. 645–663. *Ibid.*, Vol. XLII (1945), "A Terminology for Knowings and Knowns," pp. 240–241, 246.

to the facts," rather than "prescriptive in empirical enquiry."[44]

So far so good. Men are shown seeking knowledge of fact, elaborating descriptions, and changing names to fit improved descriptions. But Pepper finds himself facing the query whether this is "definition" at all? Perhaps, he reflects, the nominal and the real definitions of logical theory, the equations, the substitutions, and the ostensive definitions have exclusive rights to the field and will reject "descriptive" definitions as intruders? At any rate he feels it necessary to organize descriptive definition with respect to these others, and with a continuing eye on the question whether he can get from or through them authority for what he wishes to accomplish. Though still committing himself to the wearing of a coat of many definitional colors, the organization he seeks is in a much more modern spirit than the classifications of Dubs or the "articulated unity" of Reid.

He begins by making descriptive definition one of two great branches of definition. Over against it he sets nominal definition. The former is known by its being "responsible to facts meant by the symbol." The latter is not thus responsible, but either assumes or ignores facts, or else is irrelevant to them. Nominal definition in turn has two species: the equational and the ostensive.

The equational species is said to be strictly and solely a matter of the substitution of symbols. Whether this is an adequate expression for all that goes on in the equational processes of mathematics and in the development of equivalences, and whether it is really adequate for his own needs, Pepper does not discuss. What he is doing is to adopt a manner of treatment that is conventional among logicians who deal with logical "products" displayed on logical shelves instead of with the logical activity of living men, even though his own procedure is, culturally speaking, much further advanced than is theirs. For our present purposes we need to note that in his program equational definition is substitution—it is *this, and nothing more.*

The ostensive species of definition is (or "involves" or "refers to") a non-symbolic meaning or source of meaning for a symbol. It is primarily and typically a "pointing at." Pepper here ex-

[44] Merely as a curiosity showing the way in which words used in logic can shift back and forth, Peirce once undertook (2.330) to suggest much the same thing as Pepper now develops. Pepper's language is that "a nominal definition is by definition prescriptive." Peirce's wording was: "this definition—or rather this precept that is more serviceable than a definition." Precept and prescription are not the same etymologically, but their uses are close. Peirce's "precepts" would be a close companion for Pepper's descriptive definition; while Pepper's "prescription," in its none too complimentary use, matches closely what Peirce felt compelled to understand by definition.

amines the "facts" before him with excellent results. He suggests the interpretation of such "pointing" as "indication," and then of "indication" as "operation." The indicative "operation" at which he arrives in place of ostensive definition along the older lines is, however, still allotted status as itself a "definition." In this, there is a survival of influences of the "word and thing" mixture, even at the very moment when important steps are being taken to get rid of such conventional congealment. Oldtimers could talk readily of "ostensive *definition*" because they lived reasonably misty lives and avoided analysis in uncomfortable quarters. Pepper makes a pertinent analysis, and we are at once startled into asking: Why and how can such an ostensive or indicative operation be itself called a "definition" in any careful use of either of the words, "ostensive" or "definition"? Is there something logically in common between finger-pointing without name-using, and name-using without finger or other pointing action? If so, just *what* is it? And above all, just *where* does it "existentially" have specific location?

Pepper's problem, now, is to organize the descriptive to the ostensive and to the equational. The problem is of such great importance, and every fresh exploration of it is of such great interest, that we shall take the space to show what is apt to happen when "substitution" in the guise of "equation" is employed as organizer for a presumptively less dependable "description." We are given three diagrams, and these with their accompanying texts should be carefully studied. The diagram for equational definition shows that the symbol, "*S*," is "equated with" and is "*equationally* defined by" other "symbols." The diagram for ostensive definition shows that such an "*S*" "indicates" and is "*ostensively* defined by" an "empirical fact," "*O*." The diagram for descriptive definition expands to triadic form. "*S*" is symbol as before. "*O*" is advanced from "fact" to "field," while remaining empirical. "*D*" is added to them to stand for description. Further distinctive of this diagram is the entry into its formulations of the words "tentative," "hypothetical," and "verifies," along with "describes." The scheme of the diagram then develops in two parallel manners of expression, or formulations:

	Formulation A	Formulation B
1. (*D–O*):	*D* hypothetically describes ..	(or) is verified by ..... *O*.
2. (*S–D*):	*S* is tentatively equated with	(or) is descriptively defined by *D*.
3. (*S–O*):	*S* tentatively indicates	(or) is ostensively defined by.. *O*.[45]

[45] Certain features of the diagram should be mentioned in connection with the above transcription. There is a bare possibility, so far as diagrammatic

Under Formulation A, it would seem easy or "natural" to condense the statements to read that, given a hypothetical description of "something," we can take a word to stand tentatively for that description, and this word will then also serve as a tentative indication of the "something." Under Formulation B, we might similarly say (though various other renderings are possible) that, given a verified description of something, that description descriptively defines a word which in turn is (or is taken as) ostensively defined by the something; or we might perhaps more readily think of an ostensive hint leading through naming and description to verification or imagined verification followed by a thumping return to "ostensive *definition.*" (In a discussion in another place Pepper, to some extent, simplifies his report by saying of the descriptive definition that "strictly speaking, it is an arbitrary determination of the meaning of a symbol in terms of a symbol group, subject, however, to the verifiability of the symbol group in terms of certain indicated facts.")[46] But would it not be still more informative if one said that what substantially this all comes to is a report that men possess language in which they describe events (facts, fields)—that they can substitute single words for groups of words —that the groups of words may be called descriptive definitions —and that the words so substituted serve to indicate the facts described, and, when regarded as "verified," are linked with "indicative operations" styled "ostensive"?

Thus simplified (if he will permit it) Pepper's development may be regarded as an excellent piece of work in obliteration of ancient logical pretenses, and it might well be made required reading in preliminary academic study for every budding logician for years to come. Our only question is as to the desirability of his organization of his procedure, as if it had to undergo a set of tests supplied by the traditional logical scheme. We may ask: if equation

position goes, that the "tentatively indicates" and the "ostensively defined" on the *S–O* line should change places; our choice was made to hold the "tentatives" and "hypothetical" together in one set. The *S–D* and *S–O* statements under Formulation A (the latter transformed to read "is . . . taken to indicate") are noted as "at the same time," which possibly indicates orders of succession elsewhere which we have overlooked. (We are far from wishing to force any such successions in to the treatment.) The shiftings from active to passive verb forms may have some significance which we overlook, and the specific subject indicated for the passive verbs would be interesting to know. These difficulties are slight, and we trust none of them has interfered with a proper rendering by us of Professor Pepper's position.

[46] *The Basis of Criticism in the Arts* (1945), p. 31. The structural diagram in the book for the *D–O* of Formulation A uses "describes," and has not yet made the limitation "hypothetically describes."

is substitution or substitutability—precisely this, and nothing else —why not call it substitution in place of equation? Would not such an unequivocal naming rid us of a bit of verbal trumpery, and greatly heighten definiteness of understanding? If equation runs pure and true from symbol to symbol, what possibly can "tentative" equating be as a type of equating itself, and not merely as a preliminary stage in learning? If one turns the phrase "is equated with" into the active form "equals," how pleasing is it to find oneself saying that "*S* tentatively equals *D*"? Or, if we are told, as in one passage, that the description is "not flatly equated" with the symbol, but only "to the best of our abilities," does this add clarity? Descriptions are meant to be altered, but equations not; again, the question arises, how is it that descriptive definitions can be equated? How can "verifies" become an alternative phrasing for "hypothetically describes"? Should not the alternative form in the diagram be perhaps, "hypothetically verifies," but then what difference would there be between it and "description" itself? In introducing the "ostensive," Pepper views it in the older manner as dealing with "facts of immediacy," despite his own later reduction of it to indicative operation, and his retention of it as definition.[47] But just what could a tentative immediacy be?

The main question, further, remains: Why employ one single name, even under the differentiations of genus and species, for such variant situations in human behavior? If we take "*e*" for equationally, "*o*" for ostensively, and "*d*" for descriptively, Pepper's varieties of definition may be set down as follows:

e-defined is where a word (*S*) is substitutable for other words.

o-defined is where a word is used operationally to indicate an object, "*O*."

d-defined is where a word tentatively indicates an *O*, by being tentatively substitutable for a description, "*D*," which latter hypothetically describes the *O*; or, alternatively (and perhaps at some different phase of inquiry), *d*-defined is where a word is *o*-defined *via*, or in connection with, the "verification" of the *D* by the *O*. In preliminary, conventional forms of statement, the *e*-definition, *as he offers it* (though we do not mean to commit ourselves to such a view), seems to be primarily a matter of language-organization; the *o*-definition seems to lie in a region commonly, though very loosely, called "experience"; and the *d*-definition, so far as any one can yet see, does not seem to lie comfortably anywhere as a species of a common genus.

[47] *Loc. cit.*, p. 31.

We have seen many conflicting renderings of the word "definition" offered us in the writings of acute investigators who are currently engaged as a group in a common enterprise in a common field. Recalling these conflicts, may one not properly say that this display by itself, and just as it stands, provides sufficient reason for a thorough terminological overhaul, and that, without such an overhaul and reorganization, the normal practical needs for intercommunication in research will fail to be properly met? The one word "definition" is expected to cover acts and products, words and things, accurate descriptions and tentative descriptions, mathematical equivalences and exact formulations, ostensive definitions, sensations and perceptions in logical report, "ultimates," and finally even "indefinables."[48] No one word, anywhere in careful technical research, should be required to handle so many tasks. Where, outside of logic—except, perhaps, in ancient theology or modern stump-speaking—would such an assertion be tolerated as that of the logicians when, among the "definables" of definition, they push "indefinables" boldly to the front? Here seems to be a witches' dance, albeit of pachydermally clumsy logical will-o'-the-wisps. What more propriety is there in making definition cover such diversities than there would be in letting some schoolboy, poring perversely over the pages of a dictionary, report that the Bengal tiger, the tiger-lily, the tiger on the box, and the tiger that one on occasion bucks, are all species of one common genus: *Tiger?*

The types of definition we have inspected appear to fall roughly into three groups: namely, equivalence as in mathematics, specification as in science, and a traditionally derived mixed logical form which hopes and manoeuvres to establish specifications ultimately under a perfected logical pattern of equivalences. The worst of the affair is that present-day logic not only accepts these different activities and all their varieties as evident phases of a common process, but actually sees the great goal of all its labors to lie in their fusion into a single process, or unit in the logical system. The outcome is just the chaos we have seen.

The problem here to be solved is not one for a debating society, nor is it one for a formal calculating machine. It requires to be faced in its full historical linguistic-cultural setting. The great phases of this setting to consider are: the *logos* and the Aristotelian essences; the late medieval fracture of namings from the named as separate "things" in the exaggerated forms of "nominals" and

[48] As we have already indicated, this confusion of a great variety of things under a single name is most probably maintained under some primitive form of reference of them all to a purportedly common source in a single human "capacity," "action," or "act," derivative of the medieval soul.

"reals"; the artificially devised "concept" inserted to recognize them; the survival into modern times of this procedure by conceptual proxy under a common, though nowhere clarified, substitution of "word" (or "sentence") for "concept"; the resultant confusedly "independent" or "semi-independent" status of "words," "terms," and "propositions" as components of subject-matter; and finally the unending logical discussion of the connections of science and mathematics carried on in the inherited terminology, or in slight modifications of it, with no adequate factual examination at any stage, of the modern developments of scientific designation and mathematical symbolization in their own rights.

In this setting, and in the illustrations we have given, one feature appears that has great significance for our present consideration as showing the excesses to which the existing terminological pretenses may lead. This is the entry, of which we have repeatedly taken note,[49] and which will now receive a little closer attention, of the "ultimates" and "indefinables" as components at once of "definition" and of "reality." What we have called "specifications" and "symbolizations" can surely rate as current coin of the logical fields, no matter who does the investigating, and no matter how thorough or how precarious today's understanding of them is. The "indefinables" and the "ultimates," in contrast, are counterfeit. In them, as they enter logical discussion, we have neither good working names, nor intelligible equivalences, nor verifiable factual references, but instead pretenses of being, or of having more or less the values of, all three at once. They enter through "ostensive" definitions, or through some verbal alternative for the ostensive, but in such a way that we are unable to tell whether the "definition" itself is "about" something, or "is" the something which it is "about," or how such phrasings as "is" and "is about" are used, or just what meanings they convey. John Stuart Mill remarked a hundred years ago that, however "unambiguously" one can make known who the particular man is to whom a name belongs "by pointing to him," such pointing "has not been esteemed one of the modes of definition."[50] "Point-

[49] In the preceding reports we have had mention of indefinables by Adamson, Johnson, and Dubs. Ostensive definition has been variously treated by Pepper and Burks. Feigl also considers the ostensive definition, saying that it is "rather fashionable nowadays." He believes there should be no trouble with it, as it is either "a designation rule formulated in a semantical metalanguage" or "a piece of practical drill in the learning of the 'right use' of words." Dubs, for his part, finds it "not quite clear" enough to use.

[50] *A System of Logic*, I, 1, chap. viii, sec. 1. For a discussion in a wider background than the present of the whole problem of "demonstratives" including both the "pointings" and the "objects" pointed-at, see J. Dewey, *Logic: The Theory of Inquiry*, pages 53–54, 124, and 241–242.

ing" on the basis of previous mutual understanding is one thing, but the kind of understanding (or definition) that might be developed from pointing alone in a communicational vacuum, offers a very different sort of problem. Nevertheless, regardless of all such difficulties, the ostensive definition, since Mill's time, has gained very considerable repute, and is, indeed, a sort of benchmark for much modern logic, to which, apparently, the possession of such a name as "ostensive definition" is guarantee enough that somewhere in the cosmos there must exist a good, hard fact to go with the name. The ostensives, and their indefinables and ultimates, seem, indeed, to be a type of outcome that is unavoidable when logic is pursued as a manipulation of old terminologies presenting "definers," "realities," and "names" as separate components, rather than as an inquiry into a highly specialized form of the behaviors of men in the world around them.

We may, if we try, take these procedures of defining the indefinables apart so as to see, in a preliminary way at least, what they are made of, and how they work. What are these indefinables and ultimates assumed to be (or, verbally, to stand for) as they enter definition? Are they regarded as either "physical" or "mental"? Usually not. Instead they are spoken of as "logical" entities or existences, a manner of phrasing as to which the less it is inquired into, the better for it. Certainly there are words involved, because, without its linguistic presentation as "ostensive," there is no way, apparently, in which such definition would be before our attention at all. Certainly, also, there are "things" involved—"things" in the sense of whatever it is that is beyond the finger-nail in the direction the finger points. Certainly also there is a great background of habit and orientation, of behavior and environment, involved in every such pointing. More than this, in any community using language—and it is a bit difficult to see how definition in any form would be under close scrutiny except in a language-using community—a large part of the background of such pointing is linguistic. Suppose we consider as sample exhibits in the general region of pointings a masterless wild dog alert and tense with nose turned towards scent of game, a trained pointer in field with hunting master, the master pointing with hand for benefit of comrade towards sign of motion in brush, a savage hunter pointing or following with his eye another hunter's pointing, a tropic savage as guest in arctic watching Esquimo's finger pointed towards never-before-seen snow, and finally, the traditional Patagonian getting his first sight of locomotive as Londoner points it out. Traditionally the Patagonian sees nothing of what a locomotive "is," and certainly it would be stretching matters to

assume that the immediate case of "pointing" *defined* the locomotive to him. Hardly anywhere would a theorist speak of the wild dog as engaged in definition. In the intervening cases there are various gradations of information established or imparted *via* sign. Where does distinctive "definition" begin, and why? Where does it cease, and why? These questions concern varieties of events happening, and names needed in their study.

It is our most emphatically expressed belief that such a jumble of references as the word "definition" in the logics has today to carry can not be brought into order until a fair construction of human behaviors across the field is set up, nor until within that construction a general theory of language on a full behavioral basis has been secured.[51] We have sketched tentatively in preceding papers some of the characteristics which we believe such construction will have. Identifying behavior in general with organic-environmental sign-process, transactionally viewed, we have noted the perceptive-manipulative activities at one end of the range, and then three stages of the designatory use of language, followed by another type of use in symbolization. Given such a map of the behavioral territory, the various sorts of human procedure insistently lumped together under the name of "definition" could be allocated their proper operating regions. Among them the "ostensive," now so absurdly present, should be able, under a much needed transmutation, to find a proper home.

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BOOK NOTES

An Introduction to Peirce's Philosophy. Interpreted as a System. JAMES FEIBLEMAN. Foreword by Bertrand Russell. New York and London: Harper and Brothers. 1946. xx + 503 pp. $5.00.

For years Mr. Feibleman has immersed himself in the writings of Peirce, and it is unfortunate that such great devotion should

[51] We have already cited Skinner's view that without a developed behavioral base modern logic is undependable, and we repeat it because such a view so rarely reaches logicians' ears. Their common custom is to discard into the "pragmatic" all uncomfortable questions about logic as living process, forgetting that the "pragmatic" of Peirce and James, and of historical status, is quite the opposite, since it interprets meanings, concepts, and ideas in life. Skinner's conclusion is that eventually the verbal behavior of the scientists themselves must be interpreted, and that if it turns out that this "invalidates our scientific structure from the point of view of logic and truth-value, then so much the worse for logic, which will also have been embraced by our analysis."

yield so mediocre a book. The bulk of this "exposition" consists of quotations, brought together for the purpose of summing up what Peirce has to say on all the matters that relate to a "system." The accumulation of a great many utterances under numerous headings required labor and a definite ingenuity, and there is no doubt that it will have a certain usefulness to those who wish to make apt citation from Peirce for one purpose or another. Mr. Feibleman connects the quotations by tacitly announcing their advent or their point and by occasionally paraphrasing them. The major divisions of his organization are in the main conventional ("Metaphysics," "Logic," etc.), while the sections and sub-sections single out (more profitably) leading themes in Peirce.

If ever one philosopher needed from another what this book entirely lacks, namely, insight and critical elucidation, it is Peirce. Peirce's writing is an idiosyncratic combination of two extreme traits: one, great economy and power of statement; the other, a motley of verbal padding, interminable programming, and chatty irrelevancy. This is what makes Mr. Feibleman's technique of presentation especially infelicitous. In Feibleman the reader must hover uncertainly between puzzlement at what Peirce can mean in some passages and distress at his apparently commonplace simplicity in others. In the reading of Peirce there is at least implicit elaboration within a given context. Feibleman seems to suppose that quotations from different contexts will by themselves throw light on one another. Actually, however, the reader only struggles to reconcile them all, and more than once he is subjected to tedious recurrence of a pronouncement that remains unilluminated.

Mr. Feibleman is much concerned to present Peirce's thought as a system and unhesitatingly labels "positivists" all who would dare to discriminate by selecting ideas for exploration. But systems are not constructed by footnote cross-references, and internal coherencies are not established by reiterating a philosopher's say-so that you will find them if you look. Mr. Feibleman's book, in spite of the sub-title, contributes little "interpretation." Peirce judged his own work as a "table of contents" that promised a system. Mr. Feibleman does little more than glorify the table. Where Peirce is emphatic and repetitious, so is he. Both, for example, like to tell us how great an influence Duns Scotus was; neither gives more than a superficial reason for this emphasis.

The least unsatisfactory part of Mr. Feibleman's book is the first chapter, which is mainly biographical. The last three chapters, comprising an estimate of "Peirce's place in the history of philosophy," are characteristically free of significant generalization.

Mr. Feibleman leaves the impression of hero-worship, in spite of (or perhaps partly because of) such disclaimers as "abject discipleship is a betrayal of the master." There is reason to suspect the imminence of a Peirce-cult. A number of philosophers and journalists are creating in the mind of the lay public awesome and fantastic conceptions of Peirce's historical stature. All this is explainable as the reaction which accompanies belated recognition. But it is a pity. Peirce deserves the more philosophic honor of dispassionate criticism.

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God With Us. Three Meditations. S. L. FRANK. Translated from the Russian by Natalie Duddington. New Haven, Conn.: Yale University Press. 1946. 296 pp. $3.00.

This is an extremely interesting work by a celebrated emigré Russian philosopher. It consists of three long essays, "What is Faith?" "The Paradoxical Truth of Christianity," and "Truth as the Way and the Life." Together they form a whole which expresses Frank's belief in the divine immanence in the individual as the true basis for religion and religious organization. They represent a moderate work of the type that has been so highly developed by Russian thinkers during the past years. They are moderate, because they are written in the general spirit developed by Dostoyevsky and Solovyev, but the author accepts not only the world as it is but also as it should be. He avoids the spiritual haughtiness of Berdyaev as well as the more refined Sophianic theories of Bulgakov and his school. The book presents an outline for the average man as well as for the scholar and without denying the obstacles in the path of faith and the Church, he develops general principles that can be followed to advantage in a world of confusion by the ordinary human being. Throughout, the book is lucid and, while it is personal, it is definite and general at the same time. It deserves true consideration.

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